Long-term changes in population structure and genetic diversity of Pacific herring (*Clupea pallasi*) in Puget Sound

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Spawning aggregations of Pacific herring (*Clupea pallasi*) tend to show large interannual fluctuations in abundance, with major impacts on dependent fisheries and species relying on herring as food. It is uncertain whether these fluctuations are a result of extinctions of local populations, range shifts of a large metapopulation, or random fluctuations in a species with high recruitment variability. Recent declines in herring abundance at some spawning locations in Puget Sound, most notably at Cherry Point, have raised controversy on the status of spawning aggregates as distinct populations, especially as there was a concurrent increase in herring abundance at some other locations. While studies have shown that the Cherry Point population is genetically different from other stocks in Puget Sound, the temporal stability of this differentiation is currently unknown. In this study, we analyzed herring scales collected during WDFW herring surveys in 1981 and 2004 from Cherry Point and Quartermaster Harbor, in order to assess temporal patterns in genetic diversity and differentiation among these populations. The results will provide valuable information on long term trends in herring population structure and will help to identify the appropriate management strategy for this species.